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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/758,971

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EXAMINER

YU, JAE UN

ART UNIT

PAPER NUMBER

2185

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/758,971	<b>Applicant(s)</b> YAMAGAMI, KENJI	
	<b>Examiner</b> JAE U. YU	<b>Art Unit</b> 2185	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 28 February 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,6-14 and 16-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1,6-9,19 and 20 is/are allowed.
- 6) ☒ Claim(s) 10-13 and 18 is/are rejected.
- 7) ☒ Claim(s) 14,16 and 17 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

The examiner acknowledges the applicant's submission of the amendment dated 2/28/2008. At this point claims 1, 10 and 19 have been amended. Claims 2-5, 15 and 21-23 have been cancelled. Thus, claims 1, 6-14 and 16-20 are pending in the instant application.

### *Response to Amendment*

In view of the amendment, the examiner directs the applicant's attention to the following new ground(s) of rejection.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 10-13 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura et al. (US 2002/0078296) in view of De Margerie et al. (US 6,859,865), Fukuzumi (US 2002/0083263) and Dickensheets (US 7,133,984).

2. As per **independent claim 10**, Nakamura et al. disclose; "a first intermediate storage area [**"Main Center" 101, Figure 1**] configured to receive write data from at least one primary subsystem, the write data being received synchronously from the at

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least one primary subsystem, the first intermediate storage area defined as a consistency group with which data integrity is guaranteed **[Mirroring System, Figure 1]**", "a write-order-information provider **[“MCU”, Paragraph 80]** configured to generate write-order information **[“Time Stamp & Sequence Number”, Paragraph 80]** for the write data received from the at least one primary subsystem, the write-order information being associated with the write data **[“Write data are rearranged in the sequence number within the RCU 104”, Paragraph 80]**", "a valid counter provided in the intermediate storage system, the valid counter being configured to keep the highest sequence number of the write data **[“Time Stamp” configured to keep the highest sequence number (Seq#4 & Seq#5), Figure 3, Nakamura et al.]**", "wherein the write-order information is used to store the write data in at least one of the secondary subsystems **[“S-Vol” 111-1, Figure 1]** which is a separate storage subsystem from the intermediate storage subsystem **[“Main Center” 101, Figure 1]**, so that the at least one secondary subsystem mirrors the at least one primary subsystem **[Mirroring System, Figure 1]**".

Nakamura et al. do not disclose expressly, "first and second primary storage subsystems, the first primary storage subsystem including a first primary volume, the second primary storage subsystem including a second primary volume, the first and second primary volumes storing a plurality of write data in a given order".

De Margerie et al. disclose first and second primary storage 22a & 22b that are mirrored synchronously by first and second secondary storages 32a & 32b in Figure 1 and (Column 4, Line 54 – Column 5, Line 35).

Nakamura et al. and De Margerie et al. are analogous art because they are from the same field of endeavor of storage mirroring.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to modify Nakamura et al. by including synchronously mirrored storages as taught by De Margerie et al. in Figure 1.

The motivation for doing so would have been to guarantee that data is securely stored even if either the primary or secondary storages are destroyed as expressly taught by De Margerie et al. in Column 1, Lines 43-45.

Therefore, it would have been obvious to combine De Margerie et al. with Nakamura et al. for the benefit of secure data backup to obtain the invention specified in claim 1.

De Margerie et al. and Nakamura et al. do not teach expressly that the intermediate storage subsystem is “not directly coupled to a host unit”.

**Fukuzumi discloses the “Buffer Memory” 4 coupled in between the host unit and the flash memory in Figure 1.**

De Margerie et al., Fukuzumi and Nakamura et al. are analogous art because they are from the same filed of endeavor of controlling a plurality of storage devices.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to modify De Margerie et al. and Nakamura et al. by including a buffer between a host unit and a storage system as taught by Fukuzumi in figure 1.

The motivation for doing so would have been the cost efficient storage device as expressly taught by Fukuzumi in paragraphs 23 and 24.

Therefore, it would have been obvious to combine Fukuzumi with DeMargerie et al. and Nakamura et al. to obtain the invention as specified in claim 10.

Nakamura et al., De Margerie et al. and Fukuzumi et al. do not disclose expressly validating the write data.

**Dickensheets discloses checksum validation in column 5, lines 35-37.**

De Margerie et al., Dickensheets, Fukuzumi and Nakamura et al. are analogous art because they are from the same filed of endeavor of controlling a plurality of storage devices.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to modify De Margerie et al. and Nakamura et al. by calculating a checksum as taught by Dickensheets in figure column 5, liens 35-37.

The motivation for doing so would have been “to insure the integrity of data copied from source DSD 212 to target DSD 218” as expressly taught by Dickensheets in column 5, lines 40-41.

Therefore, it would have been obvious to combine Dickensheets, with DeMargerie et al. and Nakamura et al. for the benefit of protecting data integrity to obtain the invention as specified in claim 10.

3. **Claim 11** discloses, “the first storage is configured to receive first and second write data from the at least one primary subsystem in a given order [**Paragraph 80, Nakamura et al.**], the first and second write data being provided with first and second write order information [**“Time Stamp & Sequence Number”, Paragraph 80**], respectively, by the intermediate subsystem”.

4. **Claim 12** discloses, “the write-order-information provider is a counter configured to generate sequence numbers [**“Sequence Number”, Paragraph 80, Nakamura et al.**], the generated sequence number being associated with the write data according to an order the write data are received from the at least one primary subsystem”.

5. **Claim 13** discloses, “the first storage area is a journal volume [**“Memory” 116, Paragraph 30, Nakamura et al.**] that is configured to receive write data from the plurality of primary subsystems”.

6. **Claim 18** discloses, “the intermediate storage subsystem is a disk array unit [“P-Vol”, Figure 1, Nakamura et al.]”.

### ***Conclusion***

A. Subject Matter Considered Allowable

1. **Claims 1, 6-9, 19 and 20** are allowed. **Claims 14, 16 and 17** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
2. The primary reasons for allowance of claims 1, 14 and 19 in the instant application is the combination with the inclusion in these claims that “a second storage area, wherein the plurality of primary subsystem including a first primary volume provided in a first primary subsystem, and a second primary volume provided in a second primary subsystem, wherein the first and second storage areas are first and second intermediate volume, the first intermediate volume being configured to receive write data from the first primary volume and the second intermediate volume being configured to receive write data from the second primary volume, wherein the first intermediate volume is configured to send the write data received from the first primary volume to a first secondary volume provided in a first secondary subsystem and the second intermediate volume is configured to send the write data received from the second primary volume to a second secondary volume provided in a second secondary



subsystem". The prior art of record neither anticipates nor renders obvious the above recited combination.

3. Claims 6-9, 16, 17 and 20 are allowable due to their dependency on the allowable claims 1, 14 and 19 as indicated above.

4. As allowable subject matter has been indicated, applicant's response must either comply with all formal requirements or specifically traverse each requirement not complied with. See 37 C.F.R. § 1.111(b) and § 707.07(a) of the MPEP.

B. Claims No Longer in the Application

Claims 2-5, 15 and 21-23 have been cancelled.

C. Claims Rejected in the Application

Claims 10-13 and 18 have received a first action on the merits and are subject of a first action non-final.

D. Direction of Future Remarks

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jae Un Yu who is normally available from 9:00 A.M. to 5:30 P.M. Monday thru Friday and can be reached at the following telephone number: (571) 272-1133.

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If attempts to reach the above noted examiner by telephone are unsuccessful, the Examiner's supervisor, Sanjiv Shah, can be reached at the following telephone number: (571) 272-4098.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jae U Yu/

Examiner, Art Unit 2185

6/9/2008

/Sanjiv Shah/

Supervisory Patent Examiner, Art Unit 2185